AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) A method for controlling an acoustic field reproduction unit comprising a plurality of reproduction elements, comprising:

determining via a computer parameters from a multi-channel audio signal describing the reproduction direction of each channel of the ~~a~~ multi-channel audio signal,

determining via a computer at least spatial characteristics of the reproduction unit, the spatial characteristics comprising at least the direction of each reproduction element in the three spatial dimensions relative to a given point,

wherein the determined directions of the reproduction elements are different from the reproduction directions of the multi-channel audio signal,

determining via a computer a spatial adaptation matrix using the determined directions of the reproduction elements and the parameters describing the reproduction directions,

wherein the spatial adaptation matrix is determined such that controlling the reproduction elements with the controlling signals reproduces, in a region comprising the given point, the acoustic field that would have been obtained by controlling, with the multi-channel audio signal, ideal reproduction elements which would exactly comply with the reproduction directions of the multi-channel audio signal.

2. (previously presented) The method according to claim 1, wherein the determining at least spatial characteristics of the reproduction unit comprises an acquisition sub-step enabling all or some of the characteristics of the reproduction unit to be determined.

3. (previously presented) The method according to claim 1, wherein the determining at least spatial characteristics of the reproduction unit comprises a calibration step enabling all or some of the characteristics of the reproduction unit to be provided.

4. (previously presented) The method according to claim 3, wherein the calibration sub-step comprises, in the case of at least one of the reproduction elements:

- a sub-step for transmitting a specific signal ($u_n(t)$) to the at least one element of the reproduction unit;

- a sub-step for acquiring the sound wave emitted in response by the at least one element;

- a sub-step for converting the acquired signals into a finite number of coefficients representative of the emitted sound wave; and

- a sub-step for determining spatial and/or sound parameters of the element on the basis of the coefficients representative of the emitted sound wave.

5. (previously presented) The method according to claim 3, wherein the calibration sub-step (30) also comprises a sub-step for determining the position in at least one of the three spatial dimensions of the at least one element of the reproduction unit.

6. (previously presented) The method according to claim 3, wherein the calibration step (30) comprises a sub-step for determining the frequency response ($H_n(f)$) of the at least one element of the reproduction unit.

7. (previously presented) The method according to claim 1, wherein step for determining adaptation filters comprises:

- a sub-step for determining a decoding matrix (D) representative of filters permitting compensation for the changes in reproduction caused by the spatial characteristics of the reproduction unit;

- a sub-step for determining an ideal multi-channel radiation matrixrepresentative of the predetermined general directions associated with each data signal of the plurality of input signals; and

- a sub-step for determining a matrix representative of the adaptation filters using the decoding matrix (D) and the multi-channel radiation matrix.

8. (previously presented) The method according to claim 7, wherein the step for determining adaptation filters comprises a plurality of calculation sub-steps permitting the provision of a limit order of the spatial precision of the adaptation filters, a matrix corresponding to a spatial window representative of the distribution in space of the desired precision during the reconstruction of the sound field, and a matrix representative of the radiation of the reproduction unit, the sub-step for calculating the decoding matrix being carried out using the results of these calculation sub-steps.

9. (previously presented) The method according to claim 7, wherein the matrices for decoding, ideal multi-channel radiation and adaptation are independent of the frequency, step for determining at least one signal for controlling the elements of the reproduction unit by applying the adaptation filters corresponding to simple linear combinations followed by a delay.

10. (previously presented) The method according to claim 1, wherein the step for determining characteristics of the reproduction unit permits the determination of sound characteristics of the reproduction unit and in that the method comprises a step for determining filters for compensating for these sound characteristics, the step for determining at least one control signal then comprising a sub-step for applying the sound compensation filters.

11. (previously presented) The method according to claim 10, wherein the step for determining sound characteristics is suitable for providing parameters representative, in the case of at least one element, of its frequency response.

12. (previously presented) The method according to claim 1, wherein the step for determining at least one control signal comprises a sub-step for adjusting the gain and applying delays in order to align temporally the wavefront of the reproduction elements as a function of their distance from the given point.

13. (previously presented) The computer program comprising program code instructions for performing the steps of the method according to claim 1 when the program is performed by a computer.

14. (previously presented) The removable medium of the type comprising at least one processor and a non-volatile memory element, wherein the memory comprises a program comprising code instructions for performing the steps of the method according to claim 1, when the processor performs the program.

15. (currently amended) A device for controlling an acoustic field reproduction unit comprising a plurality of reproduction elements, comprising :

- means for determining parameters from a multi-channel audio signal describing the reproduction direction of each channel of the ~~a~~ multi-channel audio signal,

- means (116) for determining at least spatial characteristics of the reproduction unit (2), the spatial characteristics comprising at least the direction of each reproduction element in the three spatial dimensions relative to the given point,

wherein the determined directions of the reproduction elements are different from the reproduction directions of the multi-channel audio signal,

- means (114) for determining spatial adaptation matrix using the determined directions of the reproduction elements and the parameters describing the reproduction directions,

- means for determining a controlling signal for each reproduction element, by applying the adaptation matrix to the multi-channel audio signal,

wherein the spatial adaptation matrix is determined such that controlling the reproduction elements with the controlling signals reproduces, in a region comprising the given point, the acoustic field that would have been obtained by controlling, with the multi-channel audio signal, ideal reproduction elements which would exactly comply with the reproduction directions of the multi-channel audio signal.

16. (previously presented) The device according to claim 15, wherein the means for determining the at least spatial characteristics of the reproduction unit comprise means for the direct acquisition of the characteristics.

17. (previously presented) The device according to claim 15, wherein it is suitable for being associated with calibration means permitting the determination of the at least spatial characteristics of the reproduction unit.

18. (previously presented) The device according to claim 17, wherein the calibration means comprise means for acquiring a sound wave which comprise four pressure sensors arranged in accordance with a general tetrahedral shape.

19. (previously presented) The device according to claim 15, wherein the means for determining characteristics are suitable for determining sound characteristics of at least one of the elements of the reproduction unit, the device comprising means for determining sound compensation filters using the sound characteristics, and the means for determining at least one control signal being suitable for the application of the sound compensation filters.

20. (previously presented) The device according to claim 19, wherein the means for determining the sound characteristics are suitable for determining the frequency response of the elements of the reproduction unit.

21. (previously presented) An apparatus for processing audio and video data, comprising means for determining a plurality of sound data input signals each associated with a predetermined general reproduction direction defined by a given point, wherein it also comprises a device for controlling a reproduction unit according to claim 1.

22. (previously presented) The apparatus according to claim 21, wherein the means for determining a plurality of input signals are formed by a unit for reading and decoding digital audio and/or video discs.

23. (previously presented) The method according to claim 1, wherein the spatial characteristics of the reproduction unit are determined without using the multi-channel audio signal.

24. (previously presented) The method according to claim 1, wherein the spatial adaptation matrix is determined without using the multi-channel audio signal.

25. (previously presented) The method according to claim 1, wherein, when being applied, the spatial adaptation matrix remains as it has been determined.

26. (previously presented) The device according to claim 15, wherein the spatial characteristics of the reproduction unit are determined without using the multi-channel audio signal.

27. (previously presented) The device according to claim 15, wherein the spatial adaptation matrix is determined without using the multi-channel audio signal.

28. (previously presented) The device according to claim 15, wherein, when being applied, the spatial adaptation matrix remains as it has been determined.